REMARKS

Reconsideration of this application is respectfully requested in view of these remarks. The rejection of claims 1-13 and 21-26 over the combination of Sandell and Erismann is addressed first.

At the outset there is some confusion as to the grounds for rejection of claims 21 and 22. The office action on page 2 asserts that "claims 1-13 and 23-26 are rejected under 35 USC 103(a) as being unpatentable over Sandell et al. [] in view of Erismann []." But the office action goes on to discuss "claims 1, 21, 22". See page 2, line 7 from the bottom, although no specific remarks are directed separately to claims 21 or 22. The undersigned assumes that claims 21 and 22 were intended to be included in the rejection under Sandell in view of Erismann.

The following discussion will demonstrate that it is not obvious to combine these two references and that even if it were, the combination of these two references does not yield the invention set out in the claims.

The office action correctly recognizes that the Sandell motion detector head corresponds to the prior-art motion detector of the preamble to independent claims 1, 21 and 22. But Sandell is subject to the very problem that these claims seek to solve and certainly does not have the structures needed to solve the problem. (Nor does Erismann.)

Recall for a moment the particular problem addressed here: How to monitor an area underneath and behind an aimable motion detector housing without significantly compromising the performance of the motion detector. There are two ways in which the performance of prior art devices is generally compromised: reduced effectiveness of coverage and increased susceptibility to false activations. The area of coverage is generally compromised in the prior art because as the motion detector head is moved to aim the main detection zones in front of the head, the detection zones looking under or behind the device are moved toward less desirable directions, if not out of the useful region altogether. The increased susceptibility to false activations arises because zones that start out looking backwards (whether angled to the sides and back or directly back) can end up looking skyward, at least in part, as the main detection zones in front of the head are aimed closer in. Thermal variations in the sky can cause false activations.

Sandell shows the type of motion detector head in which a Fresnel lens array has a main forward-facing portion for monitoring the region in front of the motion detector head. The lens array is curved around to the sides to monitor the side regions and even somewhat backwards. The lens array itself could even extend backwards somewhat. The office action comments on this at page 3, lines 5-7:

> "Sandell et al. also disclose that the field of view will have a lateral spread in the range of 90-180 degrees or possibly more which is indicative of zonal patterns being capable of monitoring a field behind the motion detector."

The point is that this arrangement is subject to both of the compromises mentioned above as the head is moved. The present invention does not merely monitor a field behind the motion detector. The present claims are concerned with what happens to that field as the motion detector is moved to various positions in its useful aimable range.

Sandell, typical of the prior art, deals with the problem by extending the forward-looking lens array around to the sides. The array could even be wrapped somewhat around the back. Fresnel lenslets at the lateral extremes of such arrays can be configured to look back (and down) somewhat.

The present invention monitors the field behind and beneath the motion detector, first, by introducing a generally downward-looking window through which to monitor under and behind the motion detector housing, and, second, by prescribing a relationship between the downward/backward detection zones and the forward detection zones.

Claim 1 requires the motion detector housing to have:

> "a generally horizontal downward looking window disposed at the underside of said housing and includes an optical arrangement focusing infra-red energy from a second plurality of detection zones through said downward looking window…"

The downward looking window provides more flexibility to define the second plurality of zones that monitor behind and beneath the motion detector than could be achieved in the arrangement of Sandell. But that is not all.

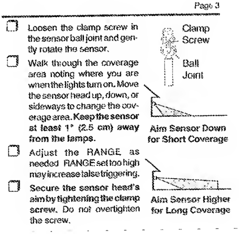
Claim 1 includes a further limitation that is not suggested by the raw combination of Sandell and Erismann. Claim 1 calls for:

> "the zones of said second zonal pattern being angulated and disposed with respect to said far level of vision such that one or more of the zones of said second zonal pattern will be in disposition for monitoring the field behind

and beneath said motion detector housing when said far field is aimed at said various positions."

This claim element sets out a relationship between the zones of the second pattern (i.e., the zones looking through the downward window to monitor behind and beneath the motion detector) and the zones monitoring the far level of vision. This is a limitation on the angle and disposition of the second zonal pattern established through the download looking window. Namely, it has to be angled and disposed to monitor the field behind and beneath the motion detector housing *as the far field is aimed at its various positions.* This is a dynamic limitation. Inherent in the aimable nature of the motion detector head—and explicit in the preamble of claim 1—is that the far field can be aimed at a number of different positions. That is what aiming means. For installations where the motion detector is mounted on a wall which is closer to the street or to a neighbor's yard, the head, and consequently the far field, will be aimed closer in to the wall for shorter coverage. If there is a greater distance to the street or neighbor's yard, then the far field will generally be aimed higher for longer coverage.

Here is a picture from an instruction manual for a prior art motion detector that illustrates aiming the far field.



As explained in applicants' specification and in earlier argument, as the head is aimed down as in these instruction manual pictures, the downward/backward-looking zones move further back and up. Claim 1, however, requires a relationship between the forward looking far field and the second zonal pattern looking behind and beneath the motion detector as the head is moved. Wherever the forward-looking part of the head is

aimed, the download looking part still has to monitor some portion of the field below and behind the motion detector head. This is, in essence, a limitation on the way the zones of the second pattern are sized, shaped, and angled with respect to the far field. There have to be enough of the zones properly aimed so that a useful portion of the field beneath the behind the head gets covered as the head is moved through the range encountered in normal use. This notion is not disclosed or suggested in Sandell, Erismann or their combination.

The Erismann reference discloses the generally horizontal downward looking window, as the office actions suggests. But the Erismann motion detector is not aimable. It is fixed on the wall. This is an important point. Erismann is not even subject to the problem that the present inventors sought to solve.

Sandell shows a prior-art motion detector head that is subject to the problem that the present inventers are trying to overcome. Erismann shows a generally horizontal downward looking window in a fixed motion detector head, which is not at all subject to the problem that the present applicant is trying to overcome. Why then would it be obvious to combine these two references? Erismann is not aimable and so does not face the problem, and Sandell is aimable and is simply an example of the very prior art motion detector head that is set out in the preamble. There is nothing in the Erismann reference, or the Sandell reference for that matter, or even in the nature of the problem sought to be solved, to suggest any connection between a generally horizontal and download looking window and the problem sought to be solved. Moreover, addition of a second window and sufficient optics to define the second zonal pattern adds cost. With no suggestion of any advantage to be achieved by the second window, and with the disadvantage of increased cost to add the second window and further optics, common sense as well as good economics says that the person of ordinary skill would not undertake to make this combination.

Furthermore, the mere combination of Sandell and Erismann does not disclose or suggest the further claim element of claim 1, quoted above, setting out the relationship of the second zonal pattern with the far field.

In summary, the combination of elements in claim 1 has an unexpected and unrecognized advantage in maintaining good monitoring performance behind and

beneath the motion detector as the motion detector is moved to aim the far field at the various available positions for closer or farther forward monitoring; the combination of references does not disclose or suggest one of the elements of claim 1; and even if one of ordinary skill might recognize that the downward window of Erismann might be used to monitor the area behind and beneath the motion detector, he or she would be dissuaded from doing so because the notion of the window itself confers no apparent big advantage and would certainly add cost.

All the examiner has done is to pick out a prior art reference (the Sandell reference) which is representative of the prior art, already admitted to be such in the preamble of the claim, and to pick out a second reference (the Erismann reference) that shows a portion of a claim element (the downward looking window), but shows is in a different motion detector setting where the problem sought to be solved does not even arise.

It is respectfully suggested that the reason the examiner suggests combining these two references is because of the drawings and descriptions in applicants' specification that so clearly lay out the problem to be solved and applicants' solution.

A few further remarks are directed to some of the dependent claims.

In claim 2 the point is that the zones of the first zonal plurality cannot monitor the field behind the motion detector housing. Only the zones of the second plurality monitor the area behind the head. The office action points to the Sandell reference as disclosing this aspect of the invention. However, all of the zones of the Sandell reference correspond to the first plurality of applicants' claims. This must be so because all of the zones of the Sandell reference come from the forward-looking window, which by definition in the parent claim 1 constitute the first plurality of zones. That is, Sandell does not show the first zonal pattern (as defined in claim 1) staying out of the way of the second zonal pattern behind the motion detector head. While Erismann shows two zonal patterns through the forward and downward looking windows, the Erismann motion detector head does not move as required in the parent claim 1. In claim 2 the first zonal pattern does not overlap with the field behind the motion detector throughout the full range of movement of the motion detector head over the normal range, in which it would be moved to aim the far field in the ordinary intended use of the device. The dynamic nature of this limitation is not at all suggested by Erismann or Sandell.

Claim 3 is directed to an embodiment having a more complex first zonal pattern having at least two so-called levels of vision. Here the dynamic nature of the limitations incorporated from the parent claim 1 are that much distinguished from the prior art because there are now more zones that move about as the motion detector is aimed. This is a further impediment to recognizing the feasibility or even viability of the invention of claim 3.

Claim 4 calls for two separate and distinct sensors. Erismann shows only a single sensor. The Erismann sensor has a dual-element pyroelectric detector, as is common in the art, which does not serve the purpose of having two separate sensors. The point is that the two separate sensors of claim 4 can be aimed in different directions, whereas the two side-by-side elements of the dual element detector must necessarily be aimed in the same direction In Erismann the dual elements are intended to be aimed in the same direction so that they can cancel out so-called common-mode signals due to broad temperature changes affecting both elements at the same time. In any event, Erismann does not direct the zones of the forward-looking field to one element of the dual element sensor and the zones of the downward field to the other element of the dual element sensor. That is to say, Erismann does not have a "forward" sensor and a "downward" sensor as called for in the claim.

Erismann does not show the sensor arrangement of claim 5 largely for the same reasons as it does not show the sensor arrangement of claim 4.

Claims 6 and 9 are directed to a generally conical shape for the second zonal pattern. The point of using a cone is that the cone extends forward of the central cone axis. As head is aimed more and more downward, the parts of the conical zonal pattern extending more forward initially are swept into service monitoring the underside and back portions of the field. The conical shape, aimed as it is, is particularly advantageous with an aimable head because it is one way to make zones available for covering the area under the head as the head is aimed more and more downward. While it might be known in the prior art how to make a conical zonal pattern, there is no recognition of the advantages of this pattern in the configuration claimed here.

Claim 10 and 12 are directed to a curtain pattern for the second zonal pattern. In regard to claim 10 the office action states that the area being monitored normally

constitutes a curtain shape. In regard to claim 9 the office action states that same area normally constitutes a conical shape. In fact, neither shape is shown in the cited references. Claims 9 and 10 are directed to specialized shapes for tailoring the shape of the (second) zonal pattern monitoring the downward field. Neither shape is shown in the cited references. Each shape has its own pros and cons, but neither is suggested in the references.

Claim 11 is directed to a configuration achieving goals of the invention that is more cost effective in that it achieves these goals with only one sensor. While the references disclose single-sensor motion detectors, they do not disclose the claimed invention per the discussion of claim 1. The embodiment of claim 11 is all that much more unobvious in that it achieves the purposes of the invention while saving the cost of the second sensor.

Claim 21 has a very particular angular configuration for the second zonal pattern defined in terms of the least offset angle, which is the minimal tilt for the farthest range. The notion of offset angle is discussed in the specification at page 13, line 29, to page 14, line 10, with reference to FIGS. 6A, 6B and 7. Here the disposition of the second zonal pattern is not expressly defined with reference to the far zone as in claim 1, but instead is defined by the least offset angle. Nevertheless, the arguments stated above in connection with claim 1 generally apply here as well with allowance for the change in claim language.

Claim 22 is directed to a particular configuration in which first and second optical arrangements are used to define the first and second pluralities of detection zones. Although this claim is in independent form, the arguments stated above in connection with claim 1 generally apply here as well with allowance for the change in claim language.

Claim 23 calls for a pair of sensors "aimed generally forward and angled toward opposite sides." The office action identifies these sensors with the two elements of the (single) dual-element pyroelectric sensor of Erismann. But the dual elements of a single pyroelectric sensor must necessarily point in the same direction (as discussed above in connection with claim 5). Claim 23, on the other hand, requires the pair of sensors to be angled toward opposite sides, which is not possible with the single sensor of Erismann.

The point in this claim is that the pair of sensors on the first support structure pointing in opposite directions allows for much more complicated and sensitive first zonal patterns. This can increase the aimability of the apparatus and makes it more tempting to use some of these extra zones of greater sensitivity to monitor behind or beneath the motion detector. But this claim recognizes that even here it can be advantageous to have a separate zonal pattern for behind and beneath the motion detector with the requisite dynamic relationship with the far field.

With respect to the rejection of claims 14-17 over Sandell in view of Erismann and further in view of Schwarz, it is clear that the arguments raised above in connection with the Sandell/Erismann combination apply also to claims 14-17. In addition, the office action asserts that Schwartz discloses a second zonal pattern "being capable of extending backward only when the (motion detector housing, 12) is aimed below horizontal." The office action points to the angle α of Schwartz's FIG. 1 as the characteristic angle of the claims 14 and 15.

This is not a proper identification. The characteristic angle of claims 14 and 15 measures the angle below the horizontal that the motion detector must be aimed—that means the forward-looking side of the motion detector is tilted down below the horizontal—before the second zonal pattern begins to extend backward. Schwartz's FIG. 1 is a top view of the Schwartz motion detector. It clearly shows the angle α in the horizontal plane of the figure. The angle α measures the angle the Schwartz lens 21 is tilted to the side instead of being parallel to the back of the motion detector housing. Perhaps the examiner had in mind the Schwartz angle β shown in Schwartz's FIG. 2, which is at least in the correct plane. But the point is that the second zonal pattern of Schwartz is always pointed backwards in the normal use of the Schwartz apparatus. The Schwartz motion detector as shown in his FIGS. 1 and 2 would have to be looking up at the sky (which it is not intended to do) to bring his rearward zones forward enough that they would not look backward. In a nutshell, Schwartz's lenses 21 and 23 in his FIG. 1 and lens 23 in his FIG. 2 are tilted the opposite way from what is called for in claims 14 and 15. In applicants' claims 14 and 15 the downward zonal pattern is offset forward; in Schwartz it is offset backwards.

With regard to claims 16 and 17 no one has previously recognized the desirability of close-in zones clustered about the motion detector's vertical axis for providing on-going monitoring without compromising the area under the motion detector as the far field of the motion detector is aimed down. The density of zones called for in these claims is directed to this object.

The above explanations are believed to distinguish the prior art and show the patentability of the rejected claims. These explanations are not intended to be exhaustive, and other distinctions and explanations may yet be made. No acquiescence in the grounds of rejection given in the office action or the merits of the office action is thereby intended.

The undersigned believes that in view of the above explanations the application is now in condition for allowance and action to that effect is respectfully requested. If the examiner feels that there are any lingering issues that can be resolved by telephone or feels that a telephone interview would be beneficial in any way, he is invited to call the undersigned at 510-658-9511.

Respectfully submitted,

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I hereby certify that this correspondence is being filed electronically in the Patent and Trademark Office on the date shown below.

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